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APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
10/020,742	12/13/2001	Kishor P. Gadkaree	SP01-337	9693

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CORNING INCORPORATED
SP-TI-3-1
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EXAMINER
GREENE, JASON M

ART UNIT	PAPER NUMBER
1724	

DATE MAILED: 06/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/020,742	GADKAREE ET AL.	
	Examiner	Art Unit	
	Jason M. Greene	1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-35 is/are rejected.

7)☒ Claim(s) 5-7 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 13 December 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 and 3 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

1. Claim 5 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Since claim 5 depends from claim 6, claim 5 does not further limit the subject matter of a previous claim. For examination purposes, claim 5 was assumed to be dependent upon claim 1.

2. Claim 6 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Since claim 6 depends upon itself, claim 6 does not further limit the subject matter of a previous claim. For examination purposes, claim 6 was assumed to be dependent upon claim 1.

3. Claim 7 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Since claim 7 depends

from claim 8, claim 5 does not further limit the subject matter of a previous claim. For examination purposes, claim 7 was assumed to be dependent upon claim 1.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gadkaree et al. in view of Claussen et al.

With regard to claims 1-6, Gadkaree et al. discloses a multicellular honeycomb structure (10) composed of a ceramic material comprising a non-oxide polycrystalline phase and a cordierite phase, the non-oxide polycrystalline phase being selected from the group consisting of carbides, nitrides, and borides, wherein the non-oxide polycrystalline phase is polycrystalline silicon carbide or silicon nitride in Fig. 1 and col. 2, line 50 to col. 3, line 43. Gadkaree et al. explicitly discloses the ceramic material being a combination of a non-oxide polycrystalline phase and a cordierite phase in col. 3, lines 24-43.

Gadkaree et al. does not disclose the non-oxide polycrystalline phase constituting 10-70 percent by weight with the remainder of the ceramic material constituting the cordierite phase or the non-oxide polycrystalline phase having a particle aspect ratio of less than 3.

Claussen et al. discloses a similar ceramic material wherein the non-oxide polycrystalline phase constitutes 30 percent by weight and the cordierite phase constitutes the remaining 70 percent, wherein the non-oxide polycrystalline phase is formed from silicon carbide and silicon nitride powders in col. 1, line 5 to col. 3, line 2. Since the non-oxide polycrystalline phase is disclosed as being formed from powders, the non-oxide polycrystalline phase is seen as having a particle aspect ratio of less than 3 since the term "powders" customarily means particles having a substantially spherical shape.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the ceramic material of Claussen et al. into the multicellular honeycomb structure of Gadkaree et al. to provide a honeycomb structure having improved heat blocking and mechanical properties, as suggested by Clausen et al. in col. 1, lines 25-29.

With regard to claims 7-9, Gadkaree et al. discloses the honeycomb having an open porosity of 45 percent and a median pore size between 0.5 and 15 micrometers in col. 3, lines 9-22.

6. Claims 10-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gadkaree et al. in view of Claussen et al.

With regard to claims 10-17, Gadkaree et al. discloses a filter for trapping and combusting diesel exhaust particulates comprising a wall flow honeycomb body (10) composed of a porous ceramic material and having a plurality of parallel end-plugged cell channels (12) traversing the body from a frontal inlet to an outlet end thereof, wherein the ceramic material comprises a non-oxide polycrystalline phase and a cordierite phase, the non-oxide polycrystalline phase being selected from the group consisting of carbides, nitrides, and borides, wherein the non-oxide polycrystalline phase is polycrystalline silicon carbide or silicon nitride, and wherein the filter has an open porosity of 45 percent and a median pore size between 0.5 and 15 micrometers in Fig. 1 and col. 2, line 50 to col. 3, line 43. Gadkaree et al. explicitly discloses the ceramic material being a combination of a non-oxide polycrystalline phase and a cordierite phase in col. 3, lines 24-43.

Gadkaree et al. does not disclose the non-oxide polycrystalline phase constituting 10-70 percent by weight with the remainder of the ceramic material constituting the cordierite phase.

Claussen et al. discloses a similar ceramic material wherein the non-oxide polycrystalline phase constitutes 30 percent by weight and the cordierite phase constitutes the remaining 70 percent in col. 1, line 5 to col. 3, line 2.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the ceramic material of Claussen et al. into the multicellular honeycomb structure of Gadkaree et al. to provide a honeycomb structure having improved heat blocking and mechanical properties, as suggested by Clausen et al. in col. 1, lines 25-29.

With regard to claim 18, Claussen et al. discloses the non-oxide polycrystalline phase being formed from silicon carbide or silicon nitride powders in col. 1, line 5 to col. 3, line 2. Since the non-oxide polycrystalline phase is disclosed as being formed from powders, the non-oxide polycrystalline phase is seen as having a particle aspect ratio of less than 3 since the term "powders" customarily means particles having a substantially spherical shape.

With regard to claims 19-22, Gadkaree et al. and Claussen et al. do not explicitly disclose the filter exhibiting a mean coefficient of thermal expansion of between 20-45 $X10^{-7}/^{0}C$ or a four-point modulus of rupture as measured on a cellular bar of at least 300 pounds per square inch (psi).

However, since the filter element of Gadkaree et al. and Claussen et al. is formed from the same material and has the same porosity and pore size as the instantly claimed filter, the filter of Gadkaree et al. and Claussen et al. will inherently possess the same mechanical properties as the instantly claimed filter.

7. Claims 23-27 and 29-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gadkaree et al. in view of Claussen et al.

With regard to claims 23-27, 29-32, 34, and 35, Gadkaree et al. discloses a diesel particulate filter comprising a plugged wall-flow honeycomb filter body (10) composed of porous ceramic material and comprising a plurality of parallel end-plugged cell channels (12) traversing the body from a frontal inlet to an outlet end thereof, wherein the honeycomb body is composed of a composite ceramic having a non-oxide polycrystalline phase and an oxide phase, the non-oxide polycrystalline phase being selected from the group consisting of carbides, nitrides, and borides, wherein the non-oxide polycrystalline phase is polycrystalline silicon carbide or silicon nitride, wherein the oxide phase is magnesium aluminosilicate, cordierite, lithium aluminum silicate, polycrystalline silicon carbide, or polycrystalline silicon nitride, and wherein the filter has an open porosity of 45 percent and a median pore size between 0.5 and 15 micrometers in Fig. 1 and col. 2, line 50 to col. 3, line 43. Gadkaree et al. explicitly discloses the ceramic material being a combination of a non-oxide polycrystalline phase and a lithium aluminum silicate phase in col. 3, lines 24-43.

Gadkaree et al. does not disclose the non-oxide polycrystalline phase constituting 10-70 percent by weight with the remainder of the ceramic material constituting the oxide phase or the filter exhibiting a mean coefficient of thermal expansion of between 20-45 $X10^{-7}/^{0}C$ or a four-point modulus of rupture as measured on a cellular bar of at least 300 pounds per square inch (psi).

Claussen et al. discloses a similar ceramic material wherein the non-oxide polycrystalline phase constitutes 30 percent by weight and the cordierite phase constitutes the remaining 70 percent in col. 1, line 5 to col. 3, line 2.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the ceramic material of Claussen et al. into the filter of Gadkaree et al. to provide a honeycomb structure having improved heat blocking and mechanical properties, as suggested by Clausen et al. in col. 1, lines 25-29.

Since the filter element of Gadkaree et al. and Claussen et al. is formed from the same material and has the same porosity and pore size as the instantly claimed filter, the filter of Gadkaree et al. and Claussen et al. will inherently possess the same mechanical properties as the instantly claimed filter.

With regard to claim 33, Claussen et al. the non-oxide polycrystalline phase being formed from silicon carbide or silicon nitride powders in col. 1, line 5 to col. 3, line 2. Since the non-oxide polycrystalline phase is disclosed as being formed from powders, the non-oxide polycrystalline phase is seen as having a particle aspect ratio of less than 3 since the term “powders” customarily means particles having a substantially spherical shape.

8. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gadkaree et al. and Claussen et al. as applied to claim 27 above, and further in view of Talmy et al.

Gadkaree et al. and Claussen et al. do not discloses the oxide phase being an alkaline earth aluminum silicate selected from the group consisting of calcium aluminum silicate and barium aluminum silicate.

Talmy et al. discloses a similar ceramic material wherein the oxide phase is barium aluminum silicate in col. 1, line 14 to col. 5, line 60.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the barium aluminum silicate of Talmy et al. for the oxide phase of Gadkaree et al. and Claussen et al. to provide a diesel exhaust particulate filter having a high refractoriness and low thermal expansion, as suggested by Talmy in col. 1, lines 14-24.

9. Claims 1-4 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gadkaree et al. in view of Cleveland.

With regard to claims 1-4 and 6, Gadkaree et al. discloses a multicellular honeycomb structure (10) composed of a ceramic material comprising a non-oxide polycrystalline phase and a cordierite phase, the non-oxide polycrystalline phase being selected from the group consisting of carbides, nitrides, and borides, wherein the non-oxide polycrystalline phase is polycrystalline silicon carbide or silicon nitride in Fig. 1 and col. 2, line 50 to col. 3, line 43. Gadkaree et al. explicitly discloses the ceramic material being a combination of a non-oxide polycrystalline phase and a cordierite phase in col. 3, lines 24-43.

Gadkaree et al. does not disclose the non-oxide polycrystalline phase constituting 10-70 percent by weight with the remainder of the ceramic material constituting the cordierite phase or the non-oxide polycrystalline phase having a particle aspect ratio of less than 3.

Cleveland discloses a similar ceramic material wherein the non-oxide polycrystalline phase constitutes 20 percent by weight and the cordierite phase constitutes the remaining 80 percent, wherein the non-oxide polycrystalline phase is formed from silicon nitride powders in col. 1, line 9 to col. 3, line 43. Cleveland discloses the ceramic material comprising 50 mole percent silicon nitride and 50 mole percent cordierite in col. 3, lines 1-5. Converting to weight percents gives the ceramic material comprising 20 weight percent silicon nitride and 80 weight percent cordierite. Since the non-oxide polycrystalline phase is disclosed as being formed from powders, the non-oxide polycrystalline phase is seen as having a particle aspect ratio of less than 3 since the term "powders" customarily means particles having a substantially spherical shape.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the ceramic material of Cleveland into the multicellular honeycomb structure of Gadkaree et al. to provide a honeycomb structure having high mechanical strength and low thermal expansion, as suggested by Cleveland in col. 1, lines 9-55.

With regard to claims 7-9, Gadkaree et al. discloses the honeycomb having an open porosity of 45 percent and a median pore size between 0.5 and 15 micrometers in col. 3, lines 9-22.

10. Claims 10-15 and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gadkaree et al. in view of Cleveland.

With regard to claims 10-15 and 17, Gadkaree et al. discloses a filter for trapping and combusting diesel exhaust particulates comprising a wall flow honeycomb body (10) composed of a porous ceramic material and having a plurality of parallel end-plugged cell channels (12) traversing the body from a frontal inlet to an outlet end thereof, wherein the ceramic material comprises a non-oxide polycrystalline phase and a cordierite phase, the non-oxide polycrystalline phase being selected from the group consisting of carbides, nitrides, and borides, wherein the non-oxide polycrystalline phase is polycrystalline silicon carbide or silicon nitride, and wherein the filter has an open porosity of 45 percent and a median pore size between 0.5 and 15 micrometers in Fig. 1 and col. 2, line 50 to col. 3, line 43. Gadkaree et al. explicitly discloses the ceramic material being a combination of a non-oxide polycrystalline phase and a cordierite phase in col. 3, lines 24-43.

Gadkaree et al. does not disclose the non-oxide polycrystalline phase constituting 10-70 percent by weight with the remainder of the ceramic material constituting the cordierite phase.

Cleveland discloses a similar ceramic material wherein the non-oxide polycrystalline phase constitutes 20 percent by weight and the cordierite phase constitutes the remaining 80 percent, wherein the non-oxide polycrystalline phase is formed from silicon nitride powders in col. 1, line 9 to col. 3, line 43. Cleveland discloses the ceramic material comprising 50 mole percent silicon nitride and 50 mole percent cordierite in col. 3, lines 1-5. Converting to weight percents gives the ceramic material comprising 20 weight percent silicon nitride and 80 weight percent cordierite.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the ceramic material of Cleveland into the multicellular honeycomb structure of Gadkaree et al. to provide a honeycomb structure having high mechanical strength and low thermal expansion, as suggested by Cleveland in col. 1, lines 9-55.

With regard to claim 18, Cleveland discloses the non-oxide polycrystalline phase being formed from silicon carbide or silicon nitride powders in col. 1, line 9 to col. 3, line 43. Since the non-oxide polycrystalline phase is disclosed as being formed from powders, the non-oxide polycrystalline phase is seen as having a particle aspect ratio of less than 3 since the term “powders” customarily means particles having a substantially spherical shape.

With regard to claims 19-22, Gadkaree et al. and Cleveland do not explicitly disclose the filter exhibiting a mean coefficient of thermal expansion of between 20-45

$X10^{-7}/^{0}C$ or a four-point modulus of rupture as measured on a cellular bar of at least 300 pounds per square inch (psi).

However, since the filter element of Gadkaree et al. and Cleveland is formed from the same material and has the same porosity and pore size as the instantly claimed filter, the filter of Gadkaree et al. and Cleveland will inherently possess the same mechanical properties as the instantly claimed filter.

11. Claims 23-27, 29, 30, and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gadkaree et al. in view of Cleveland.

With regard to claims 23-27, 29, 30, 32, 34, and 35, Gadkaree et al. discloses a diesel particulate filter comprising a plugged wall-flow honeycomb filter body (10) composed of porous ceramic material and comprising a plurality of parallel end-plugged cell channels (12) traversing the body from a frontal inlet to an outlet end thereof, wherein the honeycomb body is composed of a composite ceramic having a non-oxide polycrystalline phase and an oxide phase, the non-oxide polycrystalline phase being selected from the group consisting of carbides, nitrides, and borides, wherein the non-oxide polycrystalline phase is polycrystalline silicon carbide or silicon nitride, wherein the oxide phase is magnesium aluminosilicate, cordierite, lithium aluminum silicate, polycrystalline silicon carbide, or polycrystalline silicon nitride, and wherein the filter has an open porosity of 45 percent and a median pore size between 0.5 and 15 micrometers in Fig. 1 and col. 2, line 50 to col. 3, line 43. Gadkaree et al. explicitly

discloses the ceramic material being a combination of a non-oxide polycrystalline phase and a lithium aluminum silicate phase in col. 3, lines 24-43.

Gadkaree et al. does not disclose the non-oxide polycrystalline phase constituting 10-70 percent by weight with the remainder of the ceramic material constituting the oxide phase or the filter exhibiting a mean coefficient of thermal expansion of between 20-45 $X10^{-7}/^{0}C$ or a four-point modulus of rupture as measured on a cellular bar of at least 300 pounds per square inch (psi).

Cleveland discloses a similar ceramic material wherein the non-oxide polycrystalline phase constitutes 20 percent by weight and the oxide phase constitutes the remaining 80 percent, wherein the non-oxide polycrystalline phase is formed from silicon nitride powders, and wherein the oxide phase is magnesium aluminum silicate (cordierite) in col. 1, line 9 to col. 3, line 43. Cleveland discloses the ceramic material comprising 50 mole percent silicon nitride and 50 mole percent cordierite in col. 3, lines 1-5. Converting to weight percents gives the ceramic material comprising 20 weight percent silicon nitride and 80 weight percent cordierite.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the ceramic material of Cleveland into the filter of Gadkaree et al. to provide a honeycomb structure having improved heat blocking and mechanical properties, as suggested by Cleveland in col. 1, lines 9-55.

Since the filter element of Gadkaree et al. and Cleveland is formed from the same material and has the same porosity and pore size as the instantly claimed filter,

the filter of Gadkaree et al. and Cleveland will inherently possess the same mechanical properties as the instantly claimed filter.

With regard to claim 33, Cleveland discloses the non-oxide polycrystalline phase being formed from silicon carbide or silicon nitride powders in col. 1, line 9 to col. 3, line 43. Since the non-oxide polycrystalline phase is disclosed as being formed from powders, the non-oxide polycrystalline phase is seen as having a particle aspect ratio of less than 3 since the term "powders" customarily means particles having a substantially spherical shape.

12. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gadkaree et al. and Cleveland as applied to claim 27 above, and further in view of Talmy et al.

Gadkaree et al. and Cleveland do not disclose the oxide phase being an alkaline earth aluminum silicate selected from the group consisting of calcium aluminum silicate and barium aluminum silicate.

Talmy et al. discloses a similar ceramic material wherein the oxide phase is barium aluminum silicate in col. 1, line 14 to col. 5, line 60.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the barium aluminum silicate of Talmy et al. for the oxide phase of Gadkaree et al. and Cleveland to provide a diesel exhaust particulate filter having a high refractoriness and low thermal expansion, as suggested by Talmy in

col. 1, lines 14-24.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Greene whose telephone number is (703) 308-6240. The examiner can normally be reached on Tuesday - Friday (7:00 AM to 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jason M. Greene
Examiner
Art Unit 1724

DUANE SMITH
PRIMARY EXAMINER
6-2-03

jmg
May 30, 2003